In the claims:

1-44 (cancelled)

45. (new) A method of treating cancer comprising administering to a patient in need thereof an anti-neoplastic therapeutic agent conjugated to a monoclonal antibody or fragment thereof, wherein the monoclonal antibody or fragment binds to a human stem cell factor receptor and inhibits binding of human stem cell factor to the receptor.

46. (new) The method of Claim 45 wherein the monoclonal antibody is produced from the hybridoma cell line ATCC No. HB 10716.

47. (new) The method of Claim 45 wherein the monoclonal antibody or fragment thereof inhibits binding of human stem cell factor to the receptor by at least 50%.

48. (new) The method of Claim 45 wherein the monoclonal antibody or fragment thereof inhibits binding of human stem cell factor to the receptor by at least 75%.

49. (new) The method of Claim 45 wherein the monoclonal antibody or fragment thereof inhibits binding of human stem cell factor to the receptor by at least 90%.

50. (new) The method of Claim 45 wherein the monoclonal antibody or fragment thereof decreases the growth rate of receptor-containing cells by at least one half.

51. (new) The method of Claim 45 wherein the monoclonal antibody or fragment thereof decreases the growth rate of receptor-containing cells by at least one tenth.

52. (new) The method of Claim 45 wherein the monoclonal antibody or fragment thereof decreases the growth rate of receptor-containing cells by at least one hundredth.

53. (new) The method of Claim 45 wherein the monoclonal antibody or fragment thereof comprises a murine variable region and a human constant region.

54. (new) The method of Claim 45 wherein the monoclonal antibody or fragment thereof comprises a murine hypervariable region and a human constant and framework region

56. (new) The method of Claim 45 wherein the monoclonal antibody or fragment thereof comprises a human monoclonal antibody.

57. (new) The method of Claim 45 wherein the monoclonal antibody or fragment thereof comprises a pharmaceutical composition containing the antibody.

58. (new) The method of Claim 57 wherein the composition comprises one or more of a buffer, diluent and additive.

59. (new) The method of Claim 57 wherein the composition comprises an acetate buffer.

60. (new) The method of Claim 57 wherein the composition comprises a sterile isotonic aqueous solution.

61. (new) The method of Claim 57 wherein the composition comprises lactose or mannitol.

62. (new) The method of Claim 57 wherein the composition comprises a detergent.

63. (new) The method of Claim 45 wherein the anti-neoplastic therapeutic agent is selected from one or more of a radioisotope, a toxin, an antitumor drug, an antibiotic, and a cytostatic drug.

64. (new) The method of Claim 63 wherein the radioisotope is selected from one or more of ^{32}P, ^{131}I, ^{90}Y, ^{186}Re, ^{212}Pb and ^{212}Bi.

65. (new) The method of Claim 63 wherein the toxin is a protein of glycoprotein toxin.

66. (new) The method of Claim 63 wherein the toxin is selected from one or more of diphtheria toxin, shigella toxin, pseudomonas exotoxin, ricin, abrin, modeccin, viscumin, pokeweed antiviral protein, saporin, momordin and gelonin.

67. (new) The method of Claim 63 wherein the antitumor drug is selected from one or more daunomycin, adriamycin, aclacinomycin, eseperamycin, calicheamycin, and neocarzinostatin.

68. (new) The method of Claim 63 wherein the cytostatic drug is selected from one or more of cis-platinum, vinblastine and methotrexate.

69. (new) The method of Claim 45 wherein the cancer is a solid tumor.

70. (new) The method of Claim 45 wherein the cancer is leukemia.